REMARKS

This is in response to the Office Action dated November 29, 2002. Claims 1-16 have been canceled. Claims 17-18 were withdrawn. Claims 19 – 30 are newly added and remain in this application.

FIG. 2 has been amended to include the legend 45/54.4 degree reflector. Applicants have included two sheets of informal drawings marked in red to show this change. As soon as Examiner enters this Amendment and approves the amended drawings, Applicants will submit amended formal drawings. The legend added to FIG. 2 was disclosed in the Provisional application 60/263,103 (one of the provisional patent applications which is incorporated into this application by reference) at Figure 5 and is therefore not new matter. It more succinctly identifies the resulting angle of 54.4 degrees when the reflecting structure 212 is formed from silicon and the reflecting surface 202 is formed by anisotropic etching; which is highly selective etching along a crystalline plane so that a precise angle is formed in order to reflect the light at that angle. Such an anisotropic etching of silicon can be accomplished with potassium hydroxide as described in the specification on page 8 at lines 24 – 27. By way of further clarification, this acute angle of 54.4 degrees becomes the complementary obtuse angle of 125.6 degrees (180 degrees minus 54.4 degrees) when measured in a clockwise arc from left to right (FIG. 2) and is well within the range of about 90 degrees to about 180 degrees noted in the specification on page 7 at line 17. The specification has been amended on page 8 at line 27 to further note the well known fact that the disclosed anisotropic etching of silicon will result in a reflecting surface at an angle of about 125.6 degrees from the substrate.

The newly added claims have been drafted to more succinctly define the invention as distinct, novel and unobvious over the collective teachings of the

known prior art. Thus, claim 19 now recites: a plurality of waveguides formed on said substrate, each of said waveguides having a cylindrical lens formed on at least one end thereof. None of the references teach such a structure. The curved surface reflector of Kuo '529 is merely a curved reflective surface. It is not a cylindrical lens and most certainly is not formed on a waveguide. Claim 19 further recites a plurality of reflective structures formed of the same material as the substrate. Although Kuo '814 shows that a waveguide can be formed as part of a substrate, it does not teach the reflective structures formed of the same material as the substrate. Rather, the substrate material 104 is defined as ceramic, FR4, a printed circuit board (PCB), or the like; while the reflective waveguide module 110 is molded. No mention is made that waveguide module 110 is molded from ceramic or any of the other listed substrate materials. Since the individual elements of claim19, as described hereinabove, are not taught by the noted references, *a fortiori*, the combination is not only novel under the provisions of 35USC102 but also non-obvious under the provisions of 35USC103. Therefore claim 19 is believed to be allowable.

Claim 20 depends from claim 19 and is believed allowable for the same reasons and also that it recites a formula for the cylindrical lens that is not taught in any of the references of record.

Claim 21 recites a monocrystalline substrate. None of the known references teach a monocrystalline substrate in the overall combination of claim 21. For this reason, claim 21 is believed to be allowable. Claims 22 – 24 are believed to be allowable for the same reasons as the claims they depend from and that they recite additional features. For example, none of the references teach an angle of approximately 125 degrees as claimed in claim 23. In fact, an approximately135 degree (45 degree acute angle) is preferred. However, the approximately 125 degree angle is one of the unique aspects of Applicants' invention. Also, the vertical cavity surface emitting laser (VCSEL) recited in claim 24 provides uniqueness to the overall combination. The advantages of using a VCSEL with

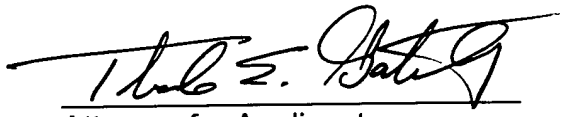
the cylindrical lens are demonstrated at Figure 6: BeamPROP simulations showing improved coupling with lens, in the provisional patent application 60/263,103, incorporated by reference.

Claim 25 recites a plurality of tapered waveguides formed on said substrate as illustrated in FIG. 2 of this application. None of the known references teach a tapered waveguide in the combination first taught by applicants. Claim 26 depends from claim 25 and is believed to be allowable for the same reason as well as rationale set forth hereinabove.

Claim 27 recites a plurality of tapered waveguides and is believed to be allowable for the same reasons as Claim 25. Claim 27 further recites a reflective structure having a reflective surface at angle determined by the crystalline plane of the monocrystalline material. Claims 28 and 30 depend from claim 27 and claim 29 depends from claim 28. These dependent claims are believed to be allowable for the same reasons as the independent claims from which they depend and also because of the additional recited features.

In view of the foregoing, Examiner is respectfully requested to enter this amendment and allow claims 19 - 30. An early notification of allowance is earnestly solicited. If Applicants' attorney can be of further assistance in this matter, Examiner is requested to telephone the undersigned at: 480-575-0744.

Respectfully submitted,
Kannan Raj, et al.



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Attachments: Request for Drawing Change
Drawing Change marked in Red (2 copies)
Petition for Extension of Time